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ABSTRACT

A study investigated the ability of above average and average high school students to use text structure to identify main ideas and write a summary. Schema possession of 388 sophomores was assessed by measuring their ability to organize the components of a scrambled passage. Only 10 students in the above average and 20 in the average ability groupings were used in the analysis; no low ability students qualified. Students were then asked to read an adversative passage and rate the individual propositions according to importance, and to read an additional passage on an alternative topic and write a summary of main ideas. The results supported the hypothesis that while average students use the same strategies as high ability students, due to the lack of automaticity in processing certain text components (e.g., unfamiliar topic, difficult vocabulary, unsignaled text,) a bottleneck occurs and average students cannot apply these strategies. Given easy text or text written on a familiar topic, average ability students used text structure to write summaries comparable to those of high ability students. However, neither topic familiarity nor ease of text aided average students in the main idea rating task. The results suggest that high ability students are more metacognitively aware than average students. (HTH)

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THE STRATEGIC ABILITIES OF ABOVE AVERAGE AND AVERAGE HIGH SCHOOL STUDENTS: A FUNCTION OF TEXT CONDITIONS

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Much emphasis in current reading research has been directed at the differing strategies used by readers of varying ability levels. The reading process is currently regarded as an interaction between the reader and the text (Rumelhart, 1977). During this interaction, the reader is actively engaged in the construction of meaning from the text (Armbruster and Anderson, 1982). In order to achieve maximum comprehension, this process of construction would appear to entail, first, a knowledge of what reading is and the subsequent demands of the reading process (metacognitive awareness) and, second, the ability to apply certain procedures in order to meet these demands (reading strategies). Research suggests that good and poor readers differ not only in their metacognitive awareness of the reading process (Myers II and Paris, 1978), but also in their ability to apply reading strategies efficiently and successfully. Since the focus of this paper concerns the reading strategies used by good and average readers, a brief review of some of the various strategies used by readers as well as a discussion

of research that addresses the differential abilities of good and poor readers to apply these strategies follows.

TOPIC FAMILIARITY

Topic familiarity or the prior knowledge that a reader has of the subject matter has been found to be one of the key components of reading comprehension. If the reader is familiar with the topic of the passage, s/he will read the material more quickly (Steffenson, Joag-Dev, and Anderson, 1979; Lipson, 1983), be able to recall more of the passage (Lipson, 1983; Marr and Gormley, 1983), be able to recall more main ideas (Steffenson et al., 1979), and make more inferences (Pearson, Hansen, and Gordon, 1979). If reading is regarded as building bridges between the known and the new then the necessity for the reader not only to be aware of the topic of the passage, but to actively seek to connect what s/he already knows with what s/he is about to learn becomes self-evident.A study by Taylor (1979), found that poor readers are not as proficient in making this connection.

INFERENCING

Inferencing has two basic functions in the processing of text. Its first function is that of text connecting, linking ideas within the passage; its second function is that of slot filling, supplying information that the author has not stated directly (Trabasso, 1981). The connection between prior knowledge and inferencing is a strong one. In order to infer missing information, the reader must have a solid knowledge base from which to draw. Research indicates that poor readers are less capable than good readers in making inferences (Olson, 1985; Wilson, 1982).

QUESTION-ANSWER RELATIONSHIPS

One of the basic factors in prose comprehension questioning activities is the relationship between the question posed about the text and the answer to be found by the student. Depending on the type of question asked, e.g. literal, inferential, a whole different set of strategies may need to be applied by the student in order to answer the question correctly. For example, in using

the taxonomy of questions identified by Pearson and Johnson (1978), a text explicit question will require the student to search for a literal answer in the passage, a text implicit question will require a student to connect or integrate two different components of text, a scriptal implicit question will require a student to draw on his or her own knowledge base to answer the question. Raphael, Winograd and Pearson (1980) studied the abilities of good and poor fourth, fifth, and sixth graders to answer questions in each of these three categories. They found that better readers were more attune to the strategies or the information source necessary to answer each type of question. Poorer readers did not demonstrate this awareness.

SUMMARIZATION

Summarization, the ability to identify the main ideas of a passage and to organize them into a coherent whole, is a key component to a current model of text comprehension (Kintsch and van Dijk,1978) and as such appears to be an essential strategy for

students' comprehension. In order to summarize, a student must be able to identify main ideas and apply summarization rules. Research has found that good readers are more capable of identifying main ideas (Winograd, 1984) and applying summarization rules (Day, 1981; Winograd, 1984).

USE OF TEXT STRUCTURE

A final strategy for consideration is reader ability to identify and use text structure. Text structure is the pattern that an author uses to organize and convey his/her message effectively. If a reader is aware of the author's structure, it can be used as an outline to identify the main ideas (Meyer, 1979). An awareness of text structure would also appear to aid recall and organization of information. Again, this use of text structure is a strategy that only good readers appear to apply consistently (Meyer, Brandt, and Bluth, 1982).

THE ISSUE OF AUTOMATICITY

In summarizing this body of literature, the good reader appears to be considerably more active while engaging in reading, bringing to bear not only his/her own knowledge of the subject matter , but also a large repertoire of skills that can be applied to text to make it meaningful. In contrast, the poorer reader appears far more passive and more inclined to consider reading as simply translating letter into sound with the hope that comprehension will occur by good fortune.

However, there is another issue that needs to be addressed in considering the differing use of comprehension strategies by good and poor readers and that is the issue of automaticity. La Berge and Samuels (1974) define automaticity in reading as the ability to process visual information without attention. Automaticity is of particular importance in view of a limited capacity model of reading. This conceptualization of reading states that all components of reading interact with each other and share a limited

capacity mechanisms. If one component demands extra processing there will be less capacity available for the other components, creating a "bottleneck" effect and comprehension will subsequently suffer (Perfetti and Hogaboam, 1975; Perfetti, 1972). Although this theory was originally applied to the effects of decoding, it can be extended to other text variables such as unfamiliarity of topic, or the lack of explicit signaling. It is therefore possible that while average and poor readers have the same strategies as good readers, they are not able to apply them due to the lack of automaticity in processing other text components. There is some evidence to support this hypothesis. McGee (1982) found that when good fifth grade readers read easy third grade level text, they were able to organize their recalls according to the author's structure. In contrast, in studies where students read more difficult text, they were unable to use text structure as an aid to comprehension (Taylor, 1980; Meyer, Brandt, and Bluth, 1980).

The purpose of this study was to investigate the ability of above average and average high school students to use text structure as a strategy to identiy main ideas and write a summary across a variety of text conditions. It was hypothesized that under certain conditions, e.g. easy text, familiar topic, explicitly signaled text, lower ability students would perform as well as above average students.

METHODOLOGY

SUBJECTS

Since the focus of the study was on student use of the text structure strategy, it was necessary to make sure that all subjects had a text schema, specifically for text organized in an adversative manner. Schema possession was assessed by measuring the subject's ability to organize the components of a scrambled passage, a methodology previously used by Kintsch, Mandel, and Kozminsky (1972) and by Fitzgerald and Spiegel, (1983).

The initial subject pool was composed of 388 sophmores in a

rural midwestern high school. There were three levels of 10th grade language arts offered at the high school, an enriched class for high ability students, a general English class for average ability students, and a basic English class for low ability students. Placement in these classes involved a combination of teacher recommendation and student choice. Because there were no standardized texting data available on these students, these class designations were used as the basis fo the ability grouping.

Subjects were given a scrambled version of a passage organized in an adversative pattern and asked to number the components in the correct order. Only those students who completed this task successfully were judged to possess a text schema and therefore were included in the data analysis. When the results of this task were examined, it was found that there was an insufficient number of students in the low ability group who possessed a text schema to include in the data analysis. There were therefore only two levels to the ability variable: high ability students enrolled in

the enriched class and average ability students enrolled in the general English class.

EXPERIMENTAL TASKS

Students were asked to read a passage organized in an adversative pattern and rate the individual propositions as to their importance using a four point rating scale. Each correctly rated proposition was given a point. They were then asked to read an additional passage on an alternate topic and write a summary of the main ideas. Summaries were scored for the number of macro (topic) statements, main idea statements, and detail statements. They were two 300 word passages used for this study. The first passage was a comparison of dolphins and sharks, a familiar topic; the second passage was a comparison of medieval and renaissance art, an unfamiliar topic. Each passage appeared in a signaled/unsignaled version and in an easy/difficult version. There were thus eight passage conditions. Each passage contained the same number of macro statements, main ideas and details.

EXPERIMENTAL DESIGN

Five four-way (2x2x2x2) ANOVAs were conducted. There were 30 students per cell, 10 in the high ability group and 20 in the average ability group. Students were randomly dropped from the analysis in order to equalize cells. The independent variables were signaling, topic familiarity, text difficulty level, and ability level. The dependent variables were the score on the main idea rating task, the macro statement score, main idea score and detail score on the summary task. Tukey Post Hoc analyses were conducted on all significant interactions.

RESULTS

Table One summarizes the main effects and interactions for all analyses. The results of this study have previously been discussed in light of an interactive-compensatory model of reading (Kinney, 1984). Since the focus of this particular paper is on the use of the text structure strategy by high ability and average students across varying text conditions, the results and discussion section

will deal solely with those results that involve the ability variable. These results include the topic familiarity and ability interactions in the main idea rating anlysis and macro analysis, and the difficulty by ability interactions in the macro, main idea and detail analyses.

TOPIC FAMILIARITY AND ABILITY INTERACTIONS

There was a topic familiarity by ability interaction in both the main idea rating analysis and summary macro statement analysis. In the main idea rating analysis (Figure 1), topic familiarity was most influential for high ability students ($p < .01$). These students made best use of the text structure strategy when the topic was familiar. Topic familiarity did not significantly affect the ability of average students to use text structure. High ability students performed significantly better than average students ($p < .01$) when reading familiar material but not when reading unfamiliar material.

In the macro statement analysis (Figure 2), students of both ability levels included more macro statements when writing summaries of familiar as opposed to unfamiliar material ($p < .05$; $p < .01$). However, the familiarity effect was significantly greater for the average than for the high ability students ($p < .01$). High ability students performed significantly better than low ability students only when the material was unfamiliar ($p < .01$).

DIFFICULTY BY ABILITY INTERACTIONS

Difficulty interacted with ability in the summary macro statement, main idea statement and detail analyses (Figures 3,4,5). In both the main idea ($p < .01$) and detail ($p < .01$) analyses, easy material improved the performance of average but not high ability students. In the summary macro statement analysis, difficult material material improved the recall of high ability but not average ability students ($p < .01$). High ability students performed significantly better than low ability students in all analyses only when the material was difficult.

DISCUSSION

Current research suggests that the high ability students are more proficient in their use of strategies than students of lower abilty. At the same time, there is evidence that suggests that some comprehension difficulties may be attributable to the lack of automaticity of certain subskills. (LaBerge and Samuels,1974). Given a limited capacity model of reading, if one reading subskill is not automatic and demands extra processing, there will be less

capacity available for other components and comprehension will consequently suffer. This conceptualization is typically termed "the bottleneck hypothesis". This paper focused on the effective use of the text structure strategy by high and average ability students across a variety of text conditions. It was hypothesized that average students use the same set of strategies as high ability students . However, due to the lack of automaticity in processing certain text components e.g. unfamiliar topic, difficult vocabulary, unsignaled text, a "bottleneck" is formed and average students can not apply these strategies.

The results of this study support this hypothesis. Average students were found to have the same knowledge of text structure as high ability students. However, they could apply this strategy only under limited conditions such as when reading easy or familiar material. When reading easy material, average students in this study used text schema as effectively as high ability students in summary writing. Across all clausal units, macro, main idea and details, their scores equalled those of the high ability students,

providing considerable support for the "bottleneck" hypothesis. Topic familiarity was a significant aid to average students only in the inclusion of macro statements.

High ability students, however, appear to be far more flexible in their use of text schema as a comprehension strategy. They were able to maintain their level of comprehension in both the main idea and detail analysis no matter what the difficulty level of the text. Their score actually increased in the macro analysis when reading difficult material. Apparently, their reliance on text structure as a comprehension strategy increased when the material became difficult. Their ability to include macro statements was affected adversely when reading unfamiliar material. However, in contrast to the average ability students, they were still able to make minimum use of the schema in the unfamiliar material.

High ability students also appear to be capable of higher levels of metacognition than low ability students. Rating the main ideas of a passage requires more metacognitive awareness of text structure than the recall demanded by a summary task, and in the

main idea rating analysis, the familiarity of the topic allowed the high ability students to approach adult levels of metacognition. Neither topic familiarity nor ease of material affected the performance of average ability students on this task. These students are apparently not yet at this cognitive level under any condition.

In summary, this study found that the use of the text structure strategy by students of varying ability levels appeared to be a function of text conditions. Given easy text or text written on a familiar topic, average ability students used text structure to write summaries comparable to those of high ability students. However, neither topic familiarity nor ease of text aided average students in the main idea rating task. Instead it was the high ability students whose scores approached adult levels of performance when reading familiar material. This result appears to indicate that high ability students are more metacognitively aware than average students.

TABLE ONE
Summary of Significant Main Effects and Interactions

VARIABLES	ANALYSES			
		SUMMARY ANALYSES		
Main Effects	**Main Idea Rating**	**Macro**	**Main Idea**	**Detail**
Topic Familiarity	p<.001	p<.00	p<.000	p<.000
Signaling	p<.001	p<.00		p<.002
Text Difficulty		p<.01	p<.000	p<.001
Ability	p<.000	p<.016	p<.001	
Interactions				
Topic Familiarity by Signaling				
Topic Familiarity by Text Difficulty			p<.03	p<.00
Topic Familiarity by Ability	p<.021	p<.016		
Signaling by Text Difficulty		p<.005		
Signaling by Ability				
Text Difficulty by Ability		p<.02	p<.01	p<.026

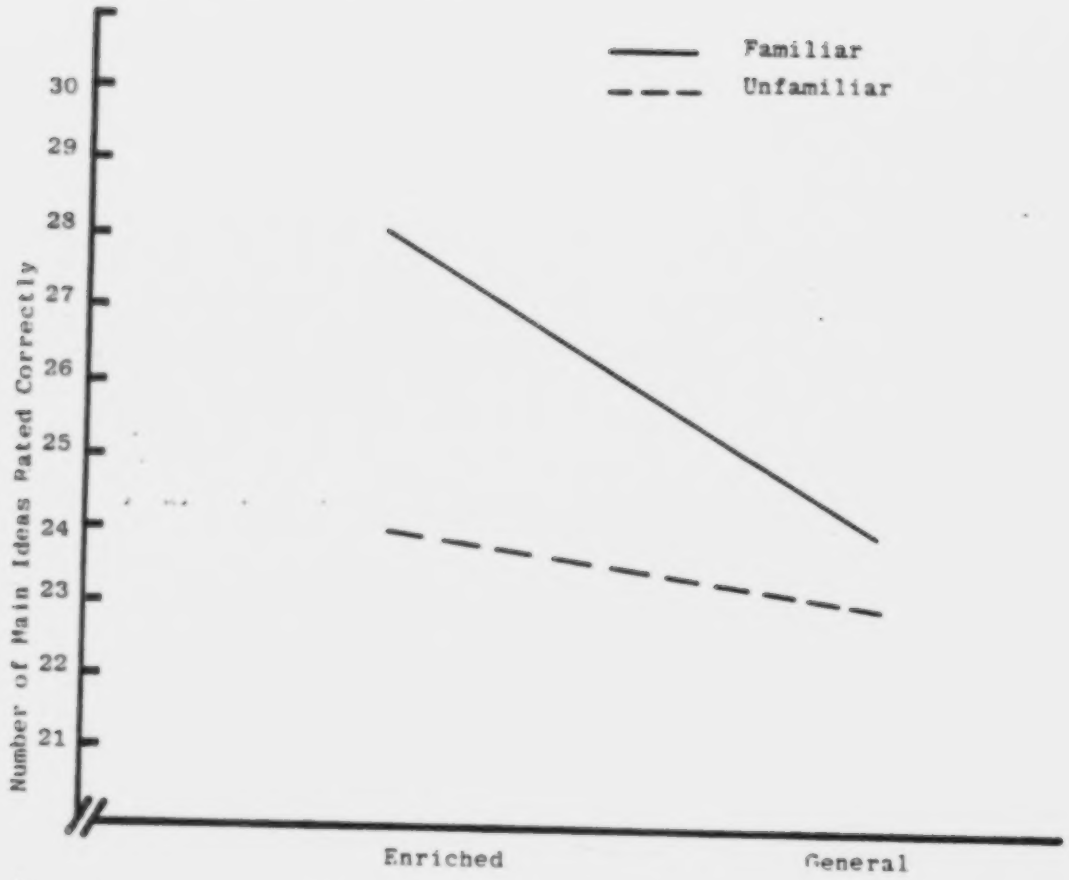

Figure 1. Topic familiarity by ability interaction: main idea rating

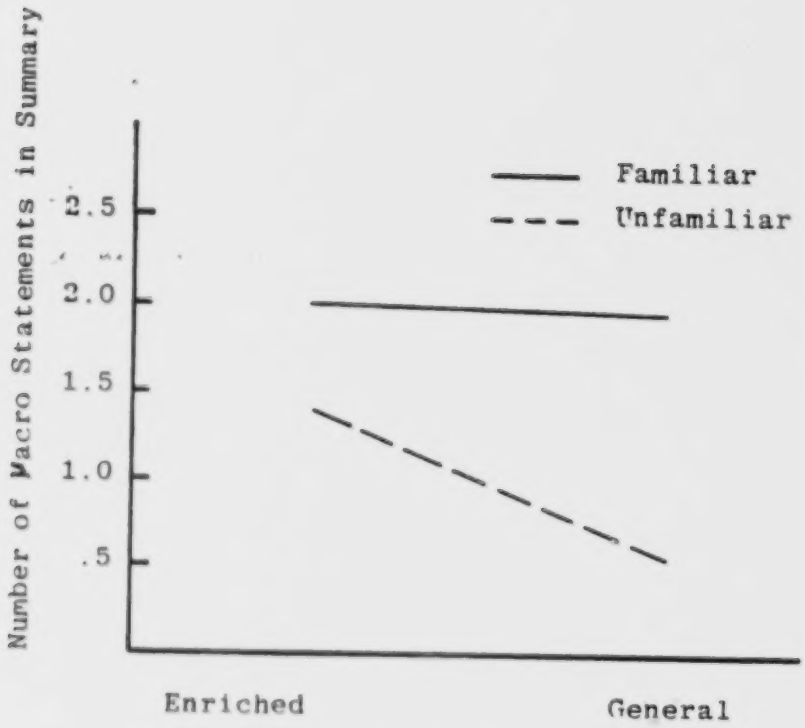

Figure 2. Topic familiarity by ability interaction: summary macro statements

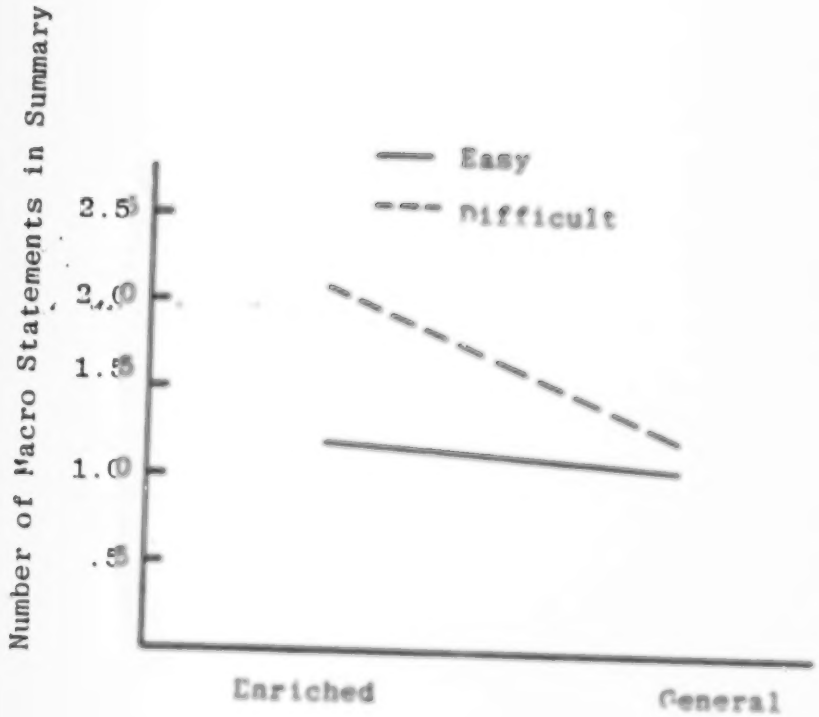

Figure 4. Difficulty by ability interaction: summary macro statements.

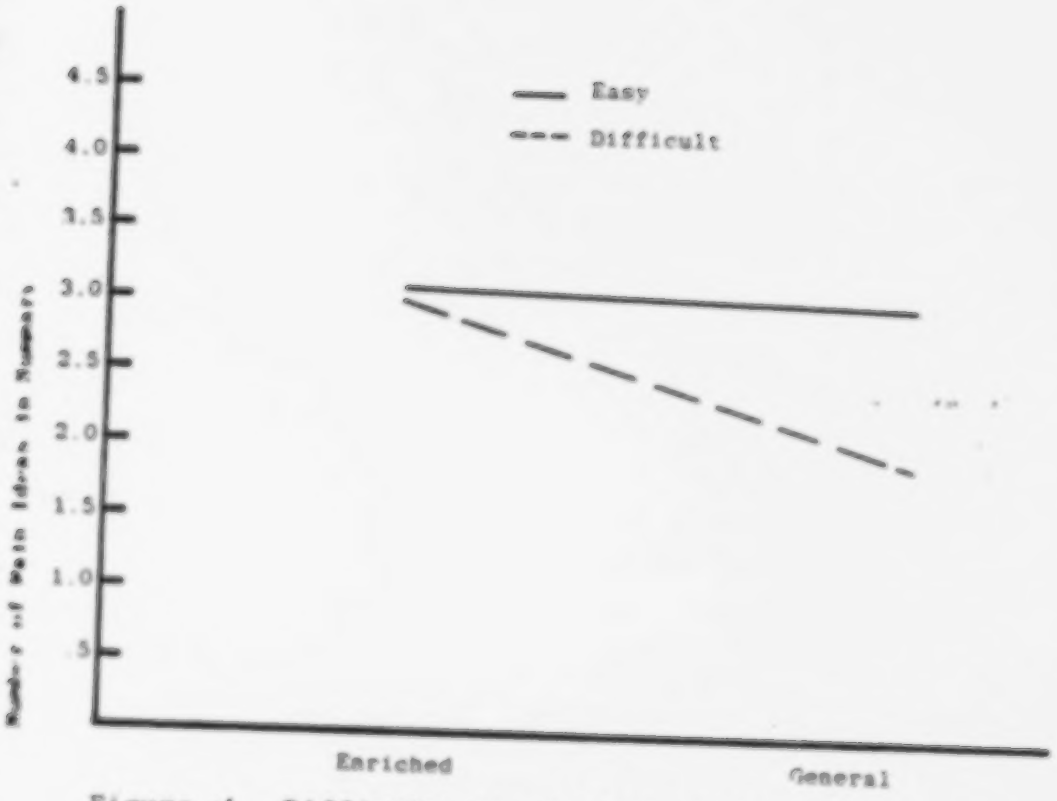

Figure 4. Difficulty by ability interaction: summary main ideas

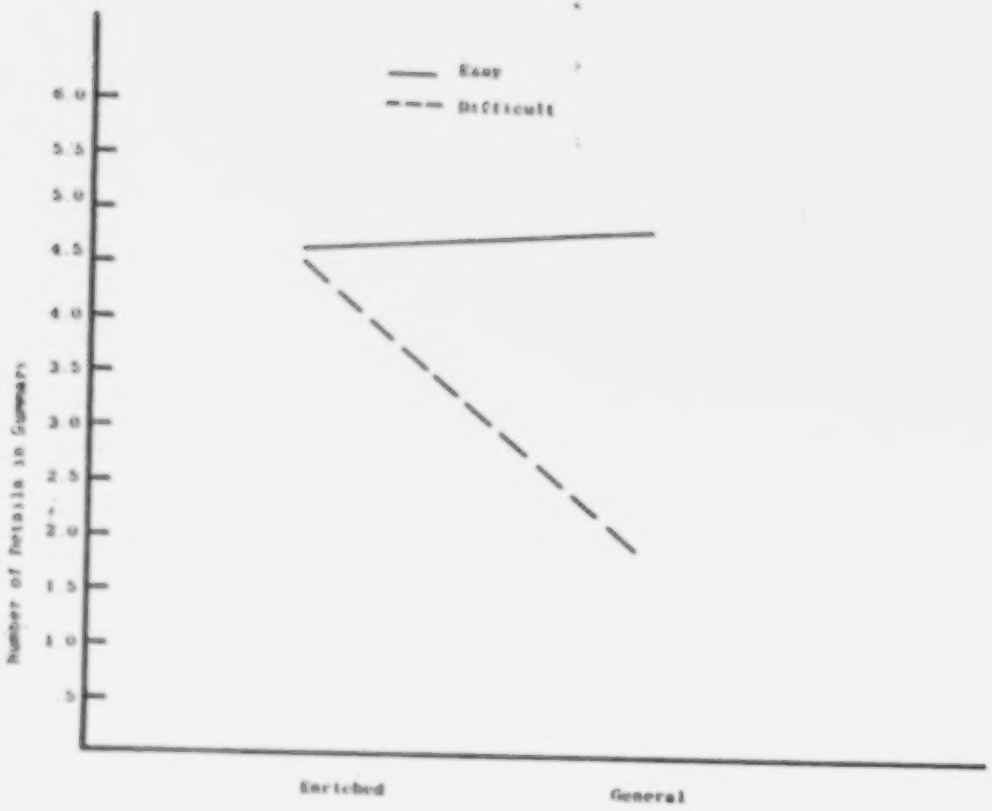

Figure 5. Difficulty by ability interaction: summary details

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